

# A Quick Guide to Weather Derivatives

## Q. What is a weather derivative?

- A weather derivative is a risk management product that allows a company to protect itself against adverse weather. Unlike conventional weather insurance where the payout is based on a demonstrated loss (“indemnification”), the payout of a weather derivative is based on a weather index (“parametric”). For example, the index used could be millimetres of rainfall or cumulative temperature using observations from a single weather reference site or a basket of sites.
- Weather derivatives are most often used to address the “volume risk” that a company faces. For example, a gas distributor may sell less gas in a mild winter thereby reducing profit. However, weather hedges can also be linked to a commodity price: for example a payout may be linked both to the oil price and weather conditions.
- Most weather contracts are over-the-counter (“OTC”) structures tailored specifically to suit the exposure of a particular business.
- The first weather derivatives traded in the late 1990s.

## Q. What is the most common weather derivative type?

- Energy market companies often use Heating Degree Days (HDD) in relation to winter temperature risk or Cooling Degree Days (CDD) in relation to summer temperature risk. Some HDD and CDD-based contracts are listed on the Chicago Mercantile Exchange (CME).
- An HDD index is calculated by subtracting the average of the daily high and low temperatures from 18 Celsius (or 65 Fahrenheit in the USA), representing the point where space heating is typically switched on. Negative values are ignored. These daily HDD values are then accumulated over monthly or seasonal periods. HDDs are often used as a proxy for gas demand.
- A CDD index is calculated by subtracting 18 Celsius (or 65 Fahrenheit in the USA) from the average of the daily high and low temperatures. Negative values are ignored. These daily CDD values are then accumulated over monthly or seasonal periods. CDDs are often used by companies exposed to power demand driven by air-conditioning.
- Hydro power companies often use an index based on cumulative precipitation measured at various sites in the relevant catchment area.
- OTC contracts are usually capped meaning that the payout is limited.
- Many weather hedges are structured as options which payout above or below a certain threshold.

## Q What sort of institutions provide weather derivative protection?

- A number of institutions in Europe and the USA are able to offer weather derivative hedges. These include insurance companies, specialist investment funds and some of the larger energy companies.

## Q How does the contractual side and settlement work?

- OTC contracts typically have an initial settlement two to five days after the expiry of the index period. There may be a subsequent adjustment based on final quality controlled settlement data. Speedwell Weather is the dominant settlement agent for OTC weather contracts worldwide.
- Standard ISDA contract confirmation templates are available for a number of standard weather hedge structures.

### **Q How are weather derivatives priced?**

- The average of the payoff of a structure over the last 10-30 years can be used as a starting point. This would set a minimum price to which a hedge-provider would add a margin to cover risk and administration costs. Recent long-term weather trends are important and will also be taken into account.

### **Q. My company's exposure is complex. Will a weather derivative work for me?**

- Weather derivatives can be tailored to correspond to very complex exposures. The weather market is accustomed to creating a product that fits the client's need exactly.
- Weather structures can be multiple triggers (ie be linked to rainfall and temperature for example), multi-site and cover one or more years.

### **Q. What sort of companies use weather derivatives?**

- A wide range including energy, agriculture, renewables, mining, retail, and construction.

### **Q. Why don't I just buy insurance?**

- Conventional insurance contracts are indemnification base and require that a loss be demonstrated. A weather derivative pays out irrespective of the *actual* impact of weather on a company.
- Insurance contracts often tend to cover high risk, low probability events whereas weather derivatives may also cover lower risk, higher probability scenarios.
- With a weather derivative it is possible to design a payout to be in proportion to the magnitude of the adverse weather phenomena.
- Weather derivatives are index-based ensuring total transparency.
- Unlike conventional insurance, there is no loss-adjustment process and settlement is therefore usually quicker.

### **Q. My company gets accurate weather forecasts – why bother hedging?**

- Knowledge of likely future weather is important, and may assist in planning decisions, but does not necessarily protect against long-range risk. Hedging weather risk allows a component of business risk to be removed and may reduce earnings volatility.

### **Q. Are these products just for large multinational companies? Would they cost too much for a business with a small turnover?**

- Not necessarily. Weather derivatives can be used by businesses of all sizes. The cost will depend on the size and the probability of the payout. Smaller businesses are often less able to cope with a volatile revenue stream.

## Further Information

Regarding weather risk pricing software and consultancy services please see [www.SpeedwellWeather.com](http://www.SpeedwellWeather.com) or contact:

Stephen Doherty [stephen.doherty@SpeedwellWeather.com](mailto:stephen.doherty@SpeedwellWeather.com)  
Dr Michael Moreno [michael.moreno@SpeedwellWeather.com](mailto:michael.moreno@SpeedwellWeather.com)  
David Whitehead (USA) [david.whitehead@SpeedwellWeather.com](mailto:david.whitehead@SpeedwellWeather.com)

### Telephone:

UK office: +44 (0) 1582 465 569  
USA office: + 1 843 737 4843

Address UK: Mardall House, Vaughan Rd, Harpenden, Herts, AL5 4HU  
Address USA: 418 King St, Floor 2, Charleston, SC 29403, USA

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